on the upper half. Pappus light-colored, one-fourth to one-third the length of the achene.

Range. Known only from the type locality, foothills of the Sierra Madre near Monterrey, Nuevo Leon, Mexico.

Specimens examined. Mexico. Nuevo Leon: Monterrey, San Agustin, 600 meters altitude, July 1, 1911, *Bro. Abbon 145* (United States National Herbarium); grassy foothills of the Sierra Madre near Monterey [*sic*], June 22, 1888, *C. G. Pringle 1923* (Gray Herbarium, type; University of California; United States National Herbarium), June 10, 1889, *2704* (Missouri Botanical Garden; University of California); near Monterrey, 540 meters altitude, May 26, 1908, *C. G. Pringle 15616* (United States National Herbarium); Hacienda Vista Hermosa, 35 miles south of Monterrey, 705 meters altitude, June 29, 1939, *Stephen S. White 1624* (Gray Herbarium); above Horsetail Falls, Villa de Santiago, 750 meters altitude, June 18, 1940, *W. C. Leavenworth 104* (Missouri Botanical Garden; New York Botanical Garden).

Department of Botany,
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August, 1943.

A REVISION OF THE GENUS FREMONTIA

Margaret Harvey

The study of the genus *Fremontia* (Sterculiaceae) was suggested to me by Dr. Philip A. Munz of Pomona College to whom I am greatly indebted for guidance and assistance. I wish to express my appreciation to Dr. Charles A. Weatherby of Gray Herbarium for help on the problem of nomenclature and to thank the curators of the following herbaria for kindly lending material which has been used in the preparation of this paper, especially Miss Alice Eastwood who generously lent type specimens from the California Academy of Sciences. The abbreviations indicated are those used in citing specimens: California Academy of Sciences (CAS); Dudley Herbarium, Stanford University (DS); University of California at Los Angeles (LA); New York Botanical Garden (NY); Pomona College (POM); Rancho Santa Ana Botanical Garden (RSA); San Diego Museum of Natural History (SD); University of California (UC).

The genus *Fremontia* was first collected by Colonel J. C. Fremont during his expedition to California from 1845 to 1847 and named and described in 1854 by John Torrey who thus commemorated the explorer for his valuable services to North American botany. An interesting and somewhat complicating situation existed at the time this genus was named in that the generic name *Fremontia* was first applied by Torrey (Fremont, First Rep., p.

95. 1845) to the plant now known as *Sarcobatus vermiculatus,* but the name *Sarcobatus* had already been given to the genus by Nees von Esenbeck, and *Fremontia* was thus a later homonym as applied to *Sarcobatus.* In naming the sterculiaceous genus *Fremontia,* Torrey mentioned the invalidity of the name as first applied and although he himself was responsible for conferring the name *Fremontia* upon two completely different groups, he attempted to clear up the situation and prevent further confusion.

Baillon (Hist. Pl. 4: 70. 1873) has referred the later *Fremontia,* our plant, to a Mexican genus, *Cheiranthodendron* Benth. & Hook. f. (*Chiranthodendron* Cerv.), an older name for *Cheirostemon* Humb. & Bonpl. (*Chirostemum* Cerv.), but Torrey, in publishing the genus as *Fremontia* also knew the genus *Cheirostemon* and pointed out some of the differences. Dr. Gray in one of his later papers (Proc. Amer. Acad. 22: 304. 1887) considered the two genera distinct. Perfect flowers without petals bind together *Fremontia* and *Cheirostemon,* but the zygomorphic flowers and sessile anthers of *Cheirostemon* would seem sufficient to separate it from *Fremontia.*

Coville, in the Death Valley Expedition botanical report (Contrib. U. S. Nat. Herb. 4: 74. 1893), proposed the name *Fremontodendron* to replace *Fremontia,* which he held to be untenable. When the specific name "mexicana" was published in 1917 by Davidson, it was in the combination *Fremontodendron mexicanum.* According to Article 61 of the 1935 International Rules, "a name of a taxonomic group is illegitimate and must be rejected if it is a later homonym . . . even if the earlier homonym is illegitimate . . ." and technically *Fremontodendron* should be adopted. The matter of later generic homonyms was referred by the Congress of 1930 to a committee for investigation and report. The names concerned were taken up alphabetically and report was duly made to the Amsterdam Congress on the letters which had been finished and a list of conserved names published (Kew Bull. Miscel. Inf. p. 81. 1940). The letters F to L were not finished in time for the Congress; technically these are still under consideration by the committee and it might be argued that until its report is made, names like *Fremontia* are likely to be conserved and therefore may be retained, even though technically illegitimate. Since *Fremontia* is the name now used by a majority of western taxonomists, it seems wise to await the results of the investigating committee before making any further changes as to nomenclature.

There has been no previous comprehensive study of the genus as a whole. For more than sixty years following the first description of the genus by Torrey it remained monotypic, until the quite distinct *Fremontodendron mexicanum* was described by Davidson (Bull. So. Calif. Acad. Sci. 16: 50. 1917). No further work was

done until Eastwood described three new species in 1934 (Leaflets West. Bot. 1: 139–140).

Several characters have been used in delimiting species of this genus. The basal pits of the calyx lobes in *F. mexicana* are devoid of hairs; in other species the glands are usually densely hairy. *Fremontia napensis* differs from other species in its smaller flowers, smaller leaves and more slender twigs. *Fremontia crassifolia* may be separated from the *F. californica-F. obispoensis* group by the thick, conspicuously three-veined leaves and matted tomentum. Other fairly reliable characters are shape of capsules, size and color of flowers, leaf outline and pubescence.

The species of this genus present an interesting geographical problem: the most restricted and the most distinct species all occur in the coastal mountain ranges of California and Baja California, whereas the polymorphic *F. californica* complex is found growing in the foothills of the hotter and drier inland mountains. One would expect *Fremontia* to occur on one or another of the islands off the coast of southern California but as far as can be ascertained, no report has ever been made of its existence there.

Systematic Treatment

Fremontia Torrey, Smithson. Contrib. 6 (Pl. Fremont.): 5, t. 2. 1854. Not *Fremontia* Torr. in Fremont First Rep., p. 95. 1843. *Fremontodendron* Coville, Contrib. U. S. Nat. Herb. 4: 74. 1893. *Cheiranthodendron* Benth. & Hook. f. of Baillon, Hist. Pl. 4: 127. 1873, in part. *Cheirostemon* Humb. & Bonpl. of Index Kewensis in error (in part).

Evergreen shrubs or small trees with stellate pubescence and mucilaginous inner bark. Leaves simple, alternate. Flowers bisexual, actinomorphic, large and showy. Calyx petaloid, open-campanulate, 5-lobed to below the middle, slightly imbricate, stellate-pubescent externally, villous internally with five pits at the base of the lobes. Petals none. Stamens 5, alternate with the sepals, joined by their filaments for about one-half their length. Ovary superior, 4- or 5-celled, surrounded by the base of the filament tube; style filiform, exserted beyond the stamens. Fruit a densely bristly-hairy capsule, 4- or 5-valved, dehiscent from the apex, persisting for many months; seeds dark, 2 or 3 in each cell.

Type species. *Fremontia californica* Torrey.

Key to Species

Pits at base of calyx lobes usually densely hairy.
Flowers small, not over 3.5 cm. in diameter, yellow, often rose-tinged; flowering twigs slender, 2–3 mm. thick; leaves small, less than 2 cm. long, with pubescence on the lower surfaces not matted; capsules conical. Napa and Lake counties ..... 1. *F. napensis*

Flowers more than 4 cm. in diameter, clear yellow.
Leaves thick, heavy, 2.5–4 cm. long, the upper surfaces conspicuously 3-veined, almost smooth above; thick matted tomentum present on stems, petioles, lower leaf surfaces; flowers large, almost 6 cm. in diameter. Coast Ranges, central California ..... 2. *F. crassifolia*
Leaves thin, upper surfaces inconspicuously veined; thick tomentum not present; flowers usually 3.5–5 cm. in diameter.
Flowering twigs slender, 2–3 mm. thick; capsule ovoid, acuminate, the length at least twice the diameter; leaves prevailingly entire. San Luis Obispo County ..... 3. *F. obispoensis*
Flowering twigs thicker, 3–5 mm. thick, capsule ovoid, little longer than thick. Mountain slopes of California ..... 4. *F. californica*
Pits at base of calyx lobes glabrous; leaves thick, heavy, conspicuously 5-veined; flowers large, 6–7 cm. in diameter, orange. San Diego County south into Baja California 5. *F. mexicana*

1. Fremontia napensis Eastwood, Leaflets West. Bot. 1: 140. 1934. *F. californica* Torr. var. *napensis* (Eastw.) McMinn, Ill. Man. Calif. Shrubs, 355. 1939.

Shrub, 2–3 meters high, spreading from the base; flowering twigs slender, 1–3 mm. thick, reddish brown, the young growing tips stellate-tomentose; leaves small, thin; blades entire or slightly sinuate to somewhat 3- to 5-lobed, 1–2 (2.5) cm. long, 0.7–1.5 cm. broad, dull or dark green above with few scattered stellate hairs; mature leaves light green below with whitish pubescence, not matted, becoming ferruginous; calyx yellow, sometimes rose-tinged, small, 3–3.5 cm. in diameter; capsule conical, 1.5 cm. long and about 1.5 cm. in diameter at the base.

Locally frequent on chaparral-covered slopes of Napa County and north into Lake County, California. Flowering period, May. Representative material. Lake County: Mirabel Mine, *Eastwood & Howell 5533* (CAS, DS, NY, POM, RSA, UC). Napa County: 15.9 miles southeast Lower Lake, *J. Clausen 1061* (DS, NY, POM, UC); 4 miles north Knoxville Mines, *Mason 10009* (CAS, DS, LA, NY, POM, RSA, UC); Hunting Creek, *Howell 14653* (CAS, DS, LA, NY, POM, RSA, UC); Knoxville, *C. F. Baker 2972* (CAS, NY, POM, UC); north side Mount St. Helena, 1926, *Hobson* (CAS, type).

This species is easily distinguished by the small flowers, the small rather thin leaves and slender branches, and is amply distinct to merit specific rank, being one of the most clear-cut entities of the genus. An interesting specimen which appears to belong to this group has been collected at Pipe Creek, Hemet Valley, Riverside County (*Munz 5805*, POM, UC). As this locality represents the southernmost limit of a number of other northern species, it may well be that this specimen should be referred to *F. napensis*.

2. Fremontia crassifolia Eastwood, Leaflets West. Bot. 1: 139. 1934.

Shrub, 2–3 meters high, twigs thick and heavy, new growth covered with a thick deciduous felt of stellate hairs; leaves thick and heavy, obtuse, 3-lobed; blades 2.5–4.5 cm. long, 2–5 cm. broad, conspicuously 3-veined, dark green above and almost smooth, densely stellate-tomentose below, becoming tawny when old; petioles one-half to one-fourth as long as the blades, densely stellate-pubescent; calyx yellow, large, about 6 cm. in diameter; capsule conical, acuminate, 2.5–3.5 cm. long, 1.5 cm. in diameter at the base.

Coast Ranges from Tehama County to Monterey County, California. Flowering period, March to May. Representative material. Tehama County: Red Bluff, 1917, *Wickes* (CAS). Alameda County: Redwood Peak, 1921, *Kelley* (CAS). San Mateo County: Butano Creek, 1897, *Dudley* (DS). Santa Clara County: on the Soquel Creek, Loma Prieta, *Elmer 5015* (CAS, DS, NY, POM, UC). Santa Cruz County: Big Basin Park, 1918, *Reed* (CAS, type). Monterey County: Salinas, 1917 *Hadden* (CAS).

This is distinguished from other Californian species by the thick, heavy, three-veined leaves, the dense stellate tomentum on the fruits, stems, petioles, and lower surfaces of leaves, by the almost smooth upper surfaces of the leaves and by the large flowers. It may previously have been confused with *F. mexicana* because of the similarity between the two in heavy pubescence, thick leaves and large flowers. However, the hairy basal pits of the calyx lobes, predominantly three- rather than five-veined leaves and clear yellow calyx readily separate *F. crassifolia.*

3. Fremontia obispoensis Eastwood, Leaflets West. Bot. 1: 140. 1934.

Shrub, with open branching; flowering twigs somewhat slender, 2–3 mm. thick, young twigs densely stellate-tomentose; leaves small, coriaceous, ovate, obtuse at apex, often with a point, truncate at base; blade prevailingly entire or slightly sinuate, 1.5–2.5 cm. long, 1–2 cm. broad, dull green above, almost smooth, with densely matted white to tawny stellate tomentum below; petiole about one-half the length of the blade; calyx yellow, large, 5–6 cm. in diameter; capsule ovoid acuminate, 2.5–3 cm. long, 1 cm. in diameter at the base.

San Luis Obispo County and south into Santa Barbara County, California. Flowering period, May. Representative material. San Luis Obispo County: Pettitts Canyon, *Eastwood 15159* (CAS, type; NY), 1935, *Sinsheimer* (CAS, DS, NY, RSA); 1 mile south Avenales Ranger Station, *Lee 626* (UC). Santa Barbara County: 4 miles southwest Big Pine Mountain, *Peterson 216* (UC).

This species is a local one, but it seems to be sufficiently distinct to merit specific rank. It resembles varieties *integra* and *diegensis* of *F. californica* in its prevailingly entire leaves but its

consistently slender twigs and long acuminate capsules readily distinguish it.

4. Fremontia californica Torrey, Smithson. Contrib. 6 (Pl. Fremont.): 5, t. 2. 1854.

Shrub, often large and tree-like, 2–4.5 (7) meters high, spreading to 4 or 5 (9) meters across; bark brownish gray, leaves and flowers produced on short lateral branches; leaves round-ovate to elliptic-ovate, 1–4 (5) cm. long, entire to usually 3-lobed, green and sparsely stellate-pubescent above, white to tawny pubescent or tomentose below; calyx clear yellow, 3.5–6 cm. in diameter, the large glands at the base of the calyx lobes usually densely hairy; capsules ovate-acuminate, 2.5–4 cm. long; seeds brown, dull.

Fremontia californica is exceedingly variable in size and shape of leaf blades with much intergradation of forms. There is also considerable variation in the number of hairs on the basal pits of the calyx lobes. Typically, the glandular pits are quite densely covered with long hairs. However, there is a gradation from densely hairy to almost glabrous with only scattered hairs around the edges of the pits or at the base of the staminal tube. Flowers of this type might be mistaken for those of *F. mexicana* upon a merely superficial examination of this single character. This subglabrous condition so intergrades with the typically hairy condition both morphologically and geographically that it does not seem feasible to make any attempt at varietal segregation based upon this character.

Key to Varieties of Fremontia Californica

Leaves variously lobed.
  Leaves dull green or dark green above; pubescence decidedly tawny below and often matted ..... 4a. var. *typica*
  Leaves bright green above; pubescence whitish below, not tawny. Tehama County ..... 4b. var. *viridis*
Leaves entire, dull green or dark green above; pubescence of lower surfaces becoming tawny.
  Petioles short, one-half to one-third the length of the blade. Tulare and Kern counties ..... 4c. var. *integra*
  Petioles longer, more than one-half the length of the blade. San Diego County ..... 4d. var. *diegensis*

4a. Fremontia californica Torrey var. typica nom. nov. *F. californica* Torr., Smithson. Contrib. 6 (Pl. Fremont.): 5, t. 2. 1854. *Cheiranthodendron californicum* (Torr.) Baill., Hist. Pl. 4: 70. 1873. *Fremontodendron californicum* (Torr.) Coville, Contrib. U. S. Nat. Herb. 4: 74. 1893. *Cheirostemon californicus* Index Kewensis Supp. 8: 49. 1933, in error.

Leaves variously lobed, dull green or dark green above, pubescence decidedly tawny below and often matted.

Dry foothills of the Sierra Nevada, south to the mountain slopes of southern California. In both the Coast Ranges and the

northern Sierra Nevada foothills the stations for *F. californica* are rare or localized. Apparently the greatest size and development are reached in the foothills of Kern County and of the San Gabriel and San Bernardino mountains where the species is a characteristic and important constituent of the chaparral belt; the typical form becomes rarer southward but does occur in Riverside and San Diego counties.

Representative material. California. "Sources of the Sacramento," *Fremont's Expedition,* 1846 (NY, type). Shasta County: North Bear Creek, *Johannsen 98* (UC). Tehama County: west Paynes Creek, *Heller 13855* (DS, NY). Nevada County: Grass Valley, 1930, *Coombs* (CAS). Mariposa County: western base Chowchilla Mountains, *Bacigalupi 1468* (DS, POM, UC). Merced County: Merced, *Lemmon 76* (UC). Fresno County: Patterson Mountain, 1914, *Wieslander* (UC). Tulare County: South Fork Kaweah River, *Culbertson 4250* (CAS, NY, POM); Eshom Valley, 1910, *Clemens* (POM, UC). Kern County: 1 mile west Onyx, *Abrams 11940* (DS, POM, UC); Keane, 1903, *Jones* (POM, UC); canyon 5 miles west Tehachapi, *Wolf 1680* (DS, LA, RSA, UC); Fort Tejon, *Vesey 16* (DS, NY), *Abrams & McGregor 272* (DS, NY); San Emigdio Canyon, 1931, *Wolf* (CAS, DS, RSA, UC); Frazier Mountain region, Cuddy Canyon, *Wolf 6933* (CAS, DS, LA, NY, POM, RSA, UC). Santa Barbara County: 2.6 miles northwest Josephine School, *Nordstrom 1330* (UC). Ventura County: Mt. Pinos, 1931, *Epling & Dunn* (LA), 1939, *Dudley* (CAS). Los Angeles County: Acton, *Elmer 3686* (DS, NY, POM); Aliso Canyon—Buckhorn Flats road, *Wolf 7861* (CAS, DS, LA, NY, POM, RSA, UC); Sulphur Springs, *Duran 3510a* (CAS, DS, LA, NY, POM, RSA, UC). San Bernardino County: Horsethief Canyon, *Clokey & Anderson 6749* (NY, RSA, UC); Sawpit Canyon, *Clokey & Anderson 7015* (NY, RSA, UC); Van Dusen Canyon, *Ownbey 1673* (DS, NY, POM); Lytle Creek Canyon, *Abrams 2696* (CAS, DS, NY), *Hall 1222* (DS, NY, UC); south side Cajon Pass, *Howell 2540* (CAS, RSA); Cushenberry Grade, 1926, *Jones* (CAS, POM); foothills, north side San Bernardino Mountains, *Parish 140* (DS, NY, UC); Riverside County: Snow Canyon, 1925, *Jaeger* (NY, POM). San Diego County: Laguna Mountains, *Eastwood 9246* (CAS); Cottonwood, 1893, *Alderson* (UC). Arizona. Gila County: Rock Creek, fork Pinto Creek, 1926, *Copple & Cooperider* (U. S. Field Station, Sacaton, Arizona); Mazatzal Mountains, 1935, *Collom* (NY, UC).

According to Dr. Carl B. Wolf (Rancho Santa Ana Botanic Garden Occasional Papers 1: 67. 1938), a shrub in the Frazier Mountain region is probably the largest specimen known in California. Its measurements were as follows: height 23 feet, spread 30 feet, four main trunks had diameters of 16, 16, 12 and 8 inches respectively and the entire tree was covered with thousands of flowers.

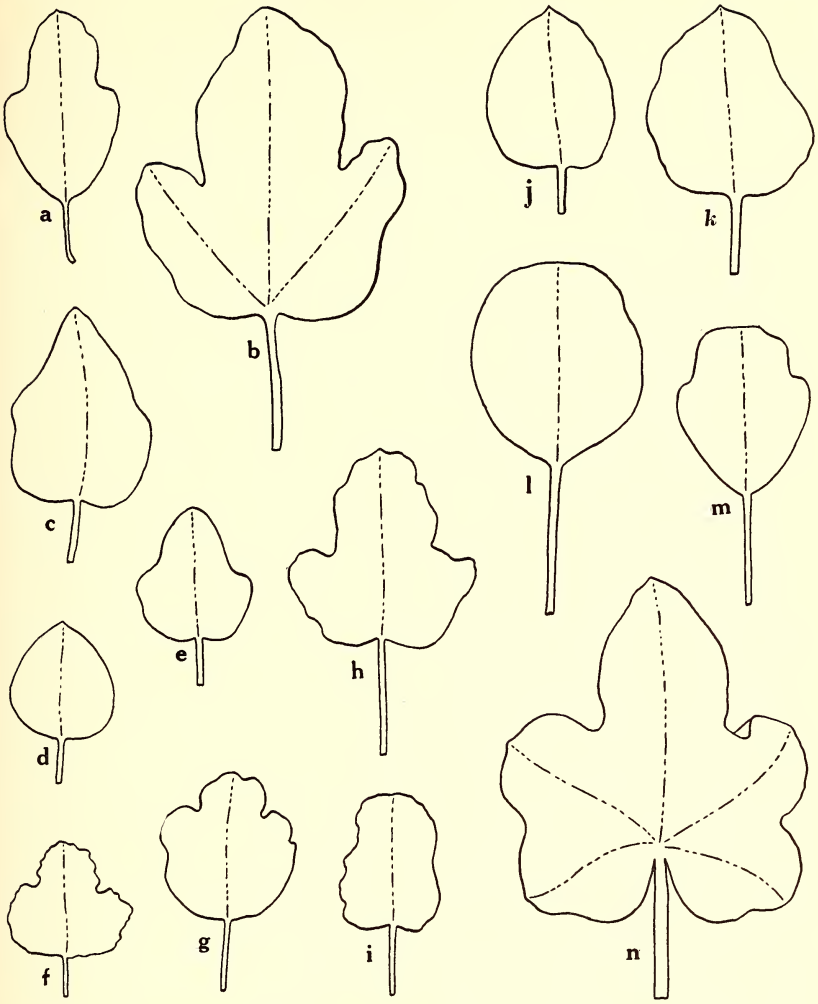

Fig. 1. *Fremontia.* Leaf measurements include both blade and petiole. *a, F. napensis, Hobson* in 1926, type (CAS), length 3.4 cm. *b, F. crassifolia, Reed* in 1918, type (CAS), length 5.8 cm. *c–e, F. obispoensis, Eastwood 15159,* type (CAS), lengths 3.4 cm., 2.4 cm., 2.2 cm. *f, F. californica* var. *typica, Fremont's Expedition,* 1846, type (NY), length 2.1 cm. *g, F. californica* var. *typica, Wolf 6993,* (POM), length 2.9 cm. *h–i, F. californica* var. *viridis, Eastwood & Howell* in 1934, type (CAS), lengths 4.0 cm., 2.7 cm. *j–k, F. californica* var. *integra, Holman* in 1933, type (POM), lengths 2.8 cm., 3.6 cm. *l–m, F. californica* var. *diegensis, Munz 9716,* type (POM), lengths 4.6 cm., 3.7 cm. *n, F. mexicana,* from garden plant, seeds from Ensenada (POM), length 5.5 cm.

The occurrence of *Fremontia* in Arizona is somewhat unexpected; I have neither seen nor heard of other reports of its existence there. The specimens cited are all from the vicinity of

Roosevelt Dam. There seems to be no characteristic by which these specimens can be separated from *F. californica* var. *typica*. The leaves on one specimen are definitely lobed but no other character exists that might link it to either *F. crassifolia* or *F. mexicana*.

4b. Fremontia californica Torrey var. **viridis** var. nov.

Folia matura viridia, varie 3-lobata; subtus sparse pubescentia, albescentia, non fulva.

Mature leaves bright clear green above, variously 3-lobed; pubescence below rather sparse, not matted, whitish, not at all tawny.

Type. Between Paynes Creek and Red Bluff, Tehama County, California, April 21, 1934, *Eastwood* and *Howell* (CAS 216397).

With var. *typica*, northern Sierra Nevada foothills of Tehama County and south into Butte County, California. Flowering period, April to May. Other collections. Tehama County: Red Bluff, 1917, *Wickes* (CAS); ridge west Paynes Creek, *Heller 15350* (NY, POM, UC); 8 miles above Paynes Creek, *Wolf 9069* (RSA); 2.3 miles below Paynes Creek, *Wolf 8704* (RSA); 10 miles west Mineral, 1939, *Cantelow* (NY). Butte County: Durham, 1935, *Brown* (CAS).

The combination of clear green leaves and whitish pubescence gives this variety a much brighter green appearance than var. *typica*.

4c. Fremontia californica Torrey var. **integra** var. nov.

Folia subintegra; laminis 1.5–3 (4) cm. longis, supra viridibus, subtus fulvescentibus; laminis bis ad ter longioribus quam petiolis.

Mature leaves subentire, blade 1.5–3 (4) cm. long, dull green above, becoming tawny pubescent below; petioles relatively short, one-half to one-third the length of the blade.

Type. Road to Mineral King, about 10 miles from Generals Highway, Tulare County, California, May 22, 1933, *R. M. Holman* (POM 209740, type; isotypes at CAS, DS, LA, NY, RSA, UC).

With var. *typica*, slopes of foothills and mountains of Tulare and Kern counties, California, rarely south. Flowering period, April to June. Other collections. Tulare County: 25 miles from Lemon Cove, 1925, *Stephens* (POM). Kern County: Greenhorn Mountains, *Weston 106* (CAS); Kern River Canyon, *Gander 7566* (SD); 4 to 5 miles south Tehachapi, *Wolf 2188* (CAS, DS, POM, RSA, UC).

This variety differs from varieties *typica* and *viridis* by its subentire leaves and may be separated from var. *diegensis* by the relatively shorter petioles.

4d. Fremontia californica Torrey var. **diegensis** var. nov.

Folia integra, supra viridia, subtus fulvescentia; laminis 2–2.5 cm. longis; laminis minus bis longioribus quam petiolis.

Mature leaves entire, dull green or dark green above, becoming tawny pubescent below; blades 2–2.5 cm. long; petioles long, more than half the length of the blade.

Type. Bottom of Vallecito Canyon, Laguna Mountains, San Diego County, California, May 17, 1925, *Philip A. Munz 9716* (POM 97297).

With var. *typica,* foothills and mountains of San Diego County, California. Flowering period, May to June. Other collections. San Diego County: 40 miles east San Diego, *Spencer 469* (NY, POM); Viejas Grade, *Wolf 7989* (RSA), 1941, *Harvey* (POM), 1935, *Gander* (DS, SD); Shaw Canyon, Laguna Mountain, *Gander 2469* (DS, SD).

Subentire leaves separate this variety from varieties *typica* and *viridis* and relatively long petioles distinguish it from the similar but geographically separate var. *integra.*

5. Fremontia mexicana (Davidson) Macbride, Contrib. Gray Herb. n.s. 53: 14. 1918. *Fremontodendron mexicanum* Davidson, Bull. So. Calif. Acad. Sci. 16: 50. 1917. *Fremontia californica* Torr. var. *mexicana* (Davidson) Jepson, Man. Fl. Pl. Calif. 637. 1925.

Large, often tree-like shrub, 2–6 meters high, spreading; branches clothed with densely matted, almost black stellate tomentum; leaves thick, heavy, 5-lobed; blade 2.5–3.5 cm. long and as broad, cordate at the base, conspicuously 5-veined, dark green above with scattered dark stellate hairs, densely matted tomentum below becoming almost black on older leaves; petioles stout, densely tomentose; calyx large, 6–7 cm. in diameter, orange becoming reddish at the base and along the midvein, with rounded pits at base of calyx lobes devoid of hairs; capsule ovoid, acuminate, 3–4 cm. long, 2 cm. in diameter at the base; seeds black, shiny.

Type locality. Dr. Davidson in his original description states that the species was first known from specimens grown by Miss Kate Sessions of San Diego from seed "collected near Ensenada." In a letter to Mr. Frank F. Gander of the San Diego Natural History Museum, Miss Sessions says that she obtained the seed from a plant found at the corner of Fourth and Fir Streets, San Diego, which she always supposed to have been brought in by Charles R. Orcutt. In conversation with Mr. Gander, she also said that she had never collected *Fremontia* seed near Ensenada nor elsewhere in Baja California. Dr. Davidson also states that the specimens upon which the description was based were gathered by Miss Sessions "15 miles from San Diego" while Miss Sessions in conversation with Mr. Gander said she thought that the material which she sent to him all came from her own yard. The species does occur in the wild within twenty miles of San Diego on the west side of Otay Mountain.

Southern San Diego County, south into Baja California. Flowering period, March to July. Representative material. California. San Diego County: Jamul, 1878, *Sanford* (SD); Monument, 1875, *Dunn* (SD); Otay Mountain, *Wolf 7982* (RSA), *Gander 1550* (POM, RSA, SD). "From a garden grown plant, seeds originally from Lower California (Ensenada)," (POM, isotype). Baja California: Johnson's Ranch (San Antonio), 1925, *Jones* (CAS, DS, NY, POM); San Antonio Canyon, 1925, *Ballou* (POM, UC); Cypress Canyon, San Antonio Mesa, 1936, *Epling & Stewart* (LA, DS, NY).

Fremontia mexicana is readily separated from other members of the genus: the rounded basal pits of the calyx lobes are devoid of hairs, the calyx is large and orange, the leaves are thick and heavy and conspicuously five-veined. Collections of *F. mexicana* have been reported from as far north as Sonoma County, but all such collections north of San Diego County that I have seen proved to be either *F. californica* var. *typica* or *F. crassifolia*. The manner of flowering of *F. mexicana* is quite different from that of the other species. Instead of a simultaneous mass of flowers, it produces fewer at one time but extends the blooms over a longer flowering period. According to Davidson (Bull. So. Calif. Acad. Sci. 16: 50. 1917), several other characters help to distinguish *F. mexicana* from the other species of *Fremontia*. The seeds are smaller and darker (this difference first caused Mr. Payne to show Dr. Davidson the seed which Miss Sessions had sent to him) and the manner of growth is at first characteristically different. "The seedlings shoot up straight as a miniature tree, while those of *F. californica* branch from near the base at an early stage."

Pomona College,
Claremont, California,
August, 1942.

THE GENUS STYRAX IN CENTRAL AND WESTERN TEXAS

V. L. Cory

Only one species of *Styrax* has been reported as occurring in central Texas whereas none was known from western Texas. The known species is *Styrax platanifolia* Engelm. which ranges from Kimble County east to Llano, Blanco and Travis counties. In this general area in 1940 I found two other well marked members of this genus which are to be differentiated, one as a variety of *S. platanifolia* and the other as a well marked species, types of which are at the Herbarium of the Arnold Arboretum. In making this study I was privileged also to examine material of another undescribed member of the genus that was taken in the Davis Mountains of southwestern Texas in 1914, and apparently